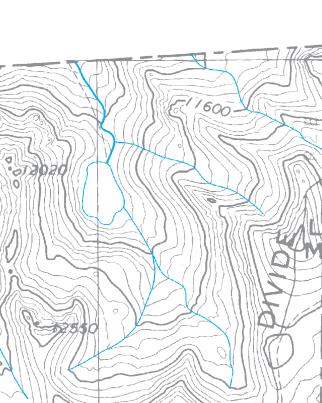
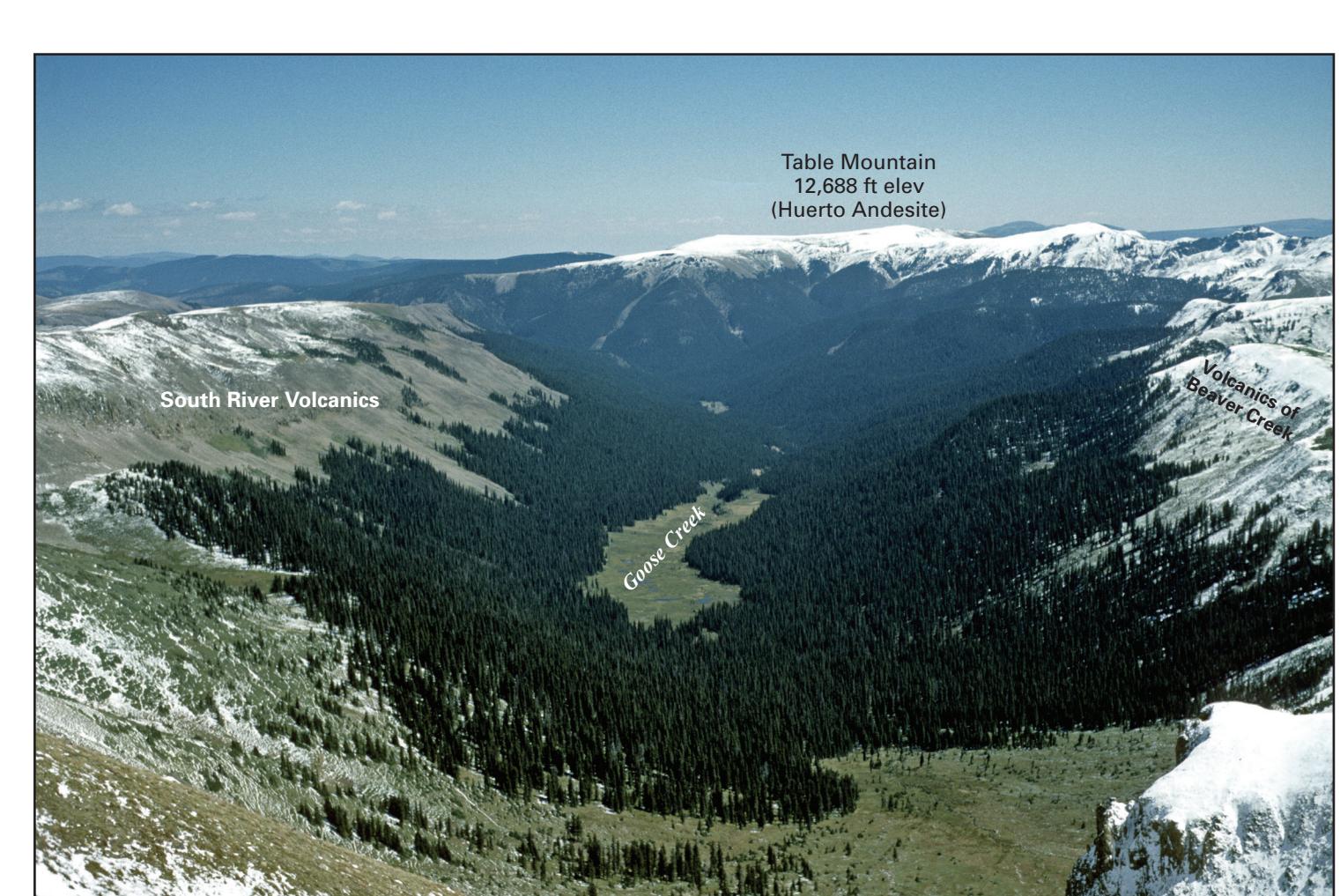


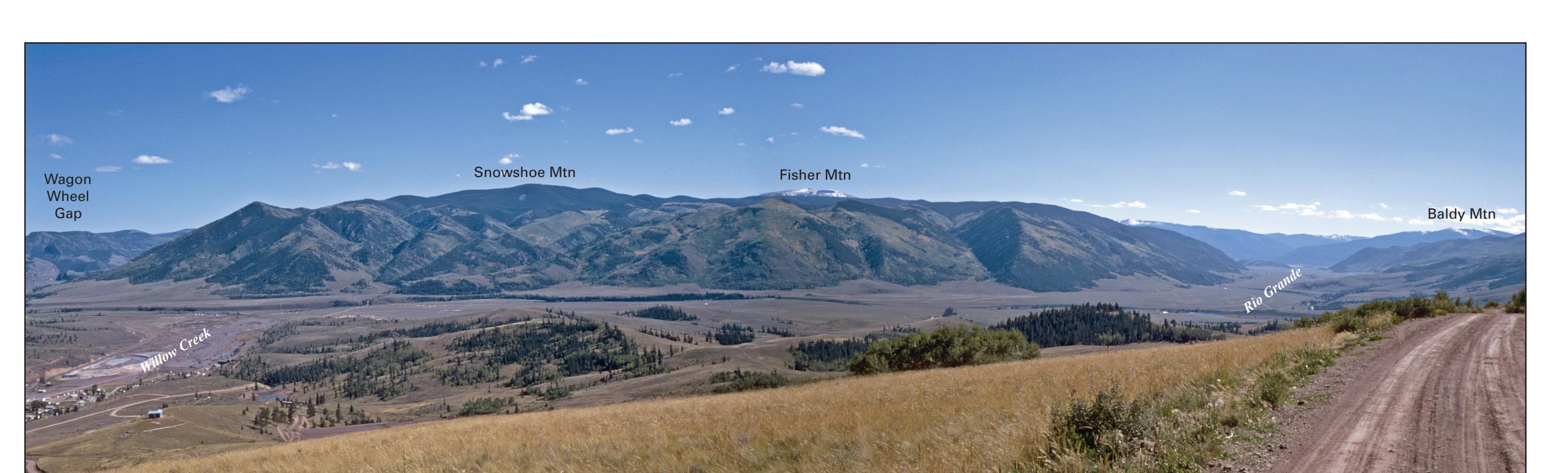
Figure 2. Map showing calderas (magenta) in the San Juan volcanic field (blue) and location of map area. Caldera margins outlined in magenta, dotted where inferred concealed by younger rocks. Caldera ages (in parentheses) are in Ma. Caldera abbreviations: CC, Cebolla Creek; NM, Nelson Mountain; RC, Rat Creek; SJ, San Juan; UC, Ute Creek.



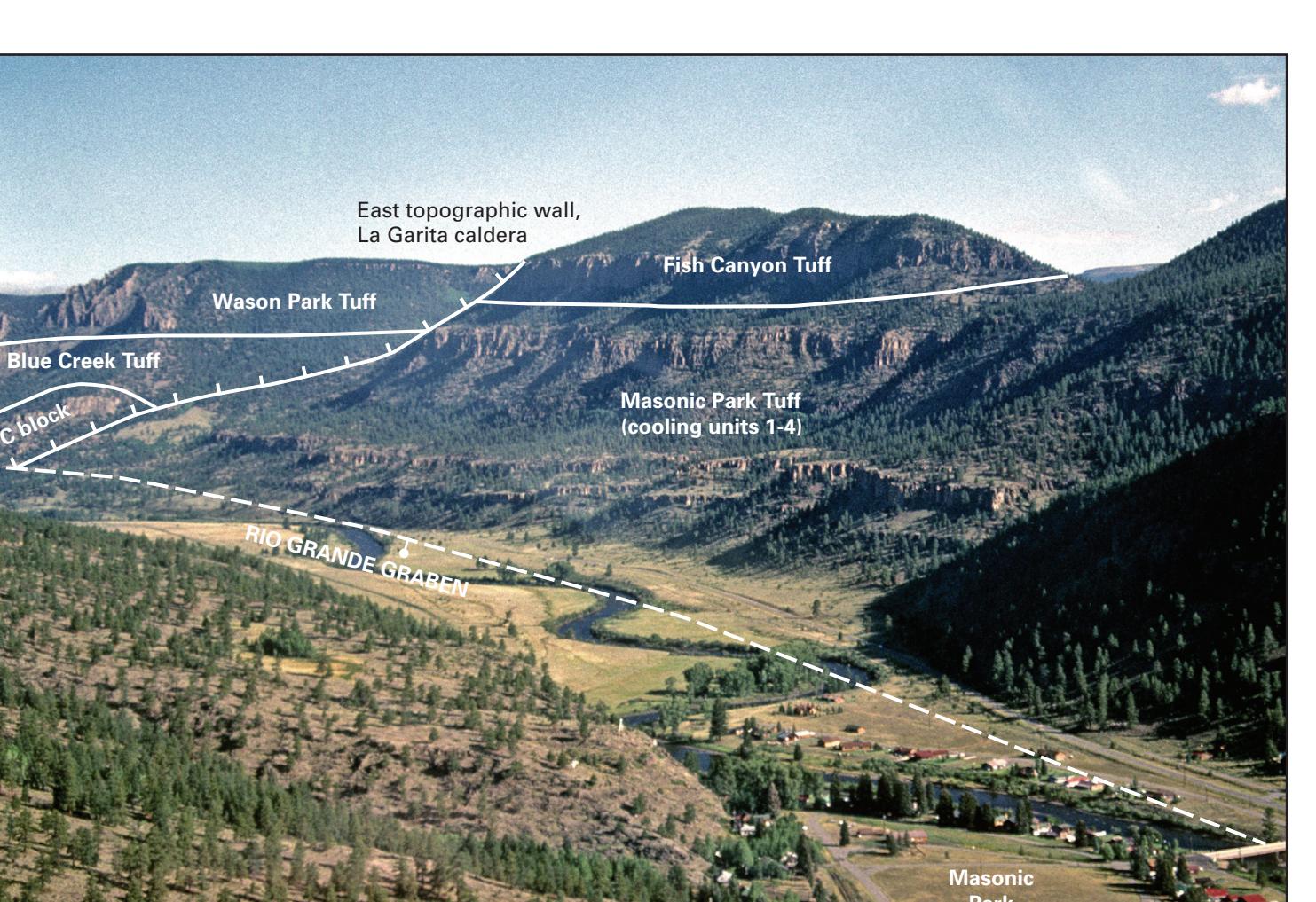
Geology mapped by P.W. Lipman (1988-1989 and 1995-96; fig. 3); assisted by D.A. Sweeny (1988-89); D. Yager (1989); C. Bachmann (1995-97); Christian Huber (1997); Olivier Roche (1998), and Charles Perrin (1999). Digital database by Joel Robinson, with contributions by Dillon Dutton, Tracey Fagan, and Michael Murphy. Edited by J.L. Ziegler. Digital cartography by Kathryn Nims. Manuscript approved for publication June 25, 2003.



Photograph showing east margin of South River caldera. View east down Grouse Creek, from South River Pass (SP). The arcuate course of Grouse Creek is probed along the contact between South River Volcanoes, which are the pockmarks of the South River caldera, and compositionally similar but older lavas and breccias of the caldera wall (Huerto Andesite, volcanoes of Beaver Creek). North-center sheet 3.



Photograph showing Crude caldera, viewed from its north wall (Bachelder road, at Wagon Wheel Gap). Table Mountain (elev. 12,488 ft) is on southwest wall (WC). Wagon Wheel Gap is east wall (WW). Fisher Mountain (elev. 12,565 ft) is a sequence of post-caldera lava flows (Fisher Dacite) on south wall (SC). Snowshoe Mountain is high point on resurgent uplifted caldera floor, defining a symmetrical dome of intracaldera Snowshoe Mountain Tuff, containing a keystone graben outlined by outward drainages and flanks dipping as steeply as 45° (Stevens and Ratti, 1985). Rio Grande flows into caldera most from the west, arcs around north side of the resurgent dome, and exits at Wagon Wheel Gap. The river has preferentially eroded weakly indurated mud-filled sediments of the Creede Formation, exhuming much of the Oligocene caldera morphology. Town of Creede at lower left. View south; north-central sheet 2.



Photograph showing east topographic wall of La Garita caldera in Rio Grande canyon between South Fork and Creek SD, which truncates multiple cooling units of the dying Masonic Park Tuff and proximal outflow of Fish Canyon Tuff. Caldera fill includes shimp block of Fish Canyon Tuff (FC). Carpenter Ridge (not labeled) is proximally overlying Blue Creek and Wason Park Tuff that wedge out against caldera wall. View northwest; southeast sheet 2.



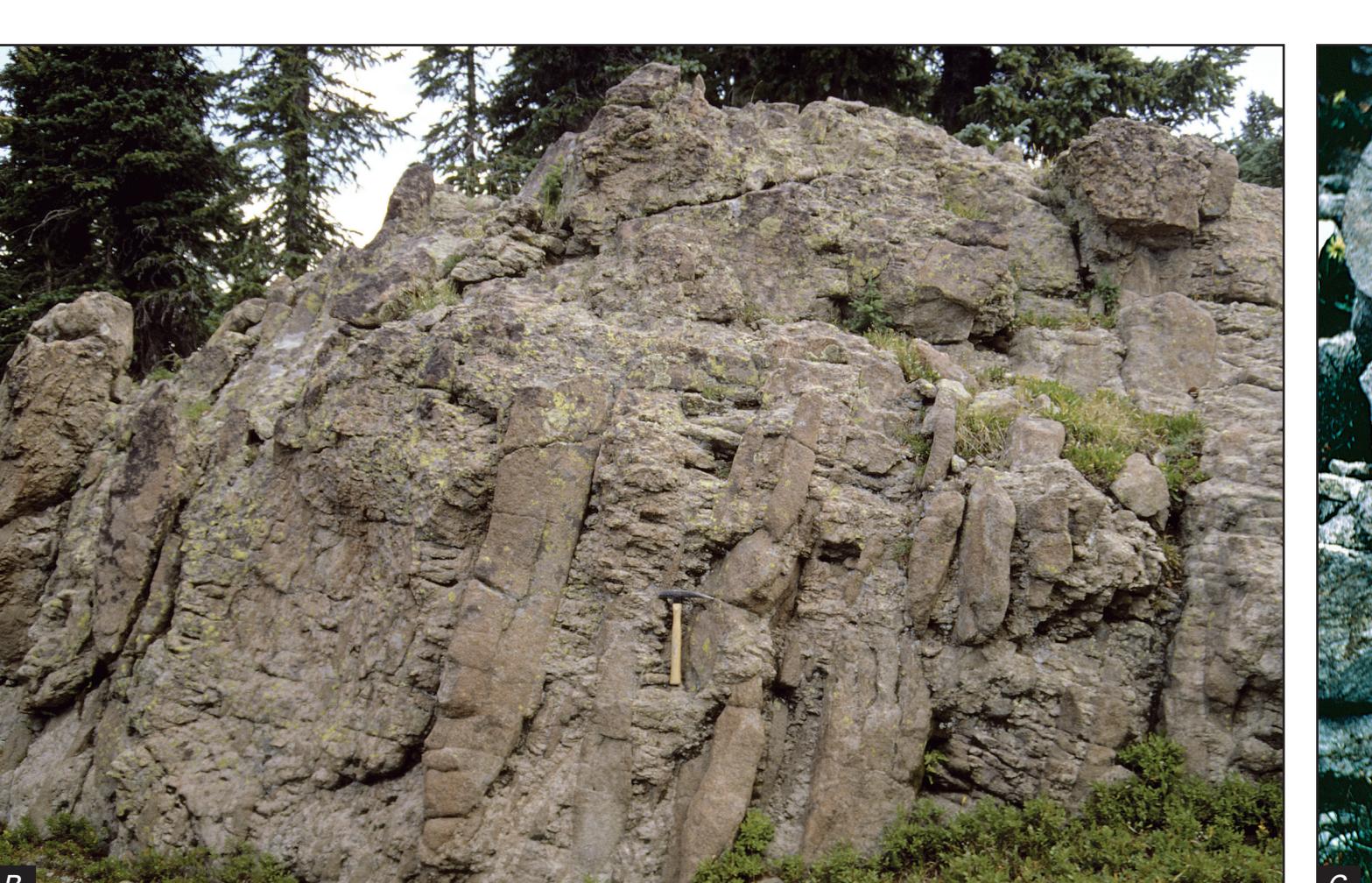
Photograph showing south-western wall of Bachelor caldera, exposed on south face of Bristol Head. Wason Park Tuff truncates against wall with thickness of more than 300 m, where ponded within Bachelor caldera, to ~1 m of ash-clad tuff higher on wall. Without intervening presence of Wason Park Tuff, the overlying andesite of Bristol Head would be lithologically nearly indistinguishable from the underlying precaldera Huerto Andesite. Camera view is oblique to trend of Bachelor wall, which dips to northeast (see Lipman, 2000, fig. 6). Looking northeast; northwest sheet 2.



Photograph showing massive intracaldera Nelson Mountain Tuff (Bachelder facies), exposed on southwest slope of San Luis Peak (elev. 14,014 ft). Entire cliff section from summit of peak (14,014 ft) to valley bottom (10,100 ft) is a single cooling unit of densely welded petrifiedly altered dacitic tuff, with no base exposed. View is from Commercial Divide, looking southeast across the head of Spring Creek (SP). View northeast; central sheet 1.



Photographs showing Pagosa Peak Dacite, an annual low-energy pyroclastic deposit premonitory to eruption of the Fish Canyon Tuff (Bachmann and others, 2000). A. Inflated block-and-ash deposit, containing dense glassy magma blobs in a more finely comminuted matrix of similar composition. Flattened pumice laminae in matrix are not deflected around blobs, indicating uniform contractional deformation of both blocks and matrix. Head of Lake Creek (WC). B. Steeply inclined (~70°) flattened blocks, defining large tarp structures in distal southeast margin of flowing lava-like interior mass of the Pagosa Peak Dacite. Note geologic hammer for scale. Along Continental Divide (northeast WC). C. Rheomorphic lava-like zone in Pagosa Peak Dacite that is flow-tarped and folded. Eagle Mountain area (PP). East-central sheet 3.



Photograph showing laminated silts and fine sand of Creede Formation (lacustrine facies), constituting meot sediments of the Creede caldera. Exposed in cutbank of Rio Grande (RC). View north; north-central sheet 2.